

Fixed-Wing Mission Editor

For use with F-22 Lightning 3 by NovaLogic

About the Mission Editor Tool

This Mission Editor tool is a slightly modified version of the actual tool used by NovaLogic Mission Designers. Although some of the campaign programming has been disabled, you will find this tool extremely flexible when it comes to designing single player Quick Missions. This manual will only cover the basic requirements for successfully creating a mission. Because mission design has so many complex components, this tool is intended for the advanced user. Use at your own risk.

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1: Navigating the Tool

There are a number of keyboard controls and toolbar buttons that will help to create missions more efficiently. Use the mouse to select items on the map. Placing the mouse over any item you created will change its icon to a box with a dot in the middle. You can either **Edit** (Left Click) or **Move** (Right Click and hold) the current selection. If the selection box does not appear, try zooming in closer to the item.

Alt G	Press ALT and the G key at the same time to toggle the grid on and off.
Arrow Keys	Use the keyboard arrow keys to scroll the map 1/8 of a screen.
Page Up	This key scrolls one full screen up.
Page Down	This key scrolls one full screen down.
Home	This key scrolls one full screen left.
End	This key scrolls one full screen right.
Plus (+)	This key will zoom in to double the current zoom ratio
Minus (-)	This key will zoom out to half the current zoom ratio.



Zoom Extends – changes the zoom ratio to fit the entire map on your screen



Zoom to Window – after clicking this button, draw a box with the move and you will zoom to the contents of the box.



or **(Ctrl + S) Select Mode** – use this mode to select and move groups of items.



or **(Ctrl + O) Object Mode** – use this mode to place, edit or move objects.



or **(Ctrl + W) Waypoint Mode** – use this mode to place, edit or move waypoints.



or **(Ctrl + T) Taxipoint Mode** - use this mode to place, edit or move taxipoints.

The Information Bar

At the bottom of the tool, the info bar displays useful numbers including the current **X/Y** coordinates of the mouse and the current zoom factor (**Z**) of the screen.

2: Creating a New Mission

Step 1: Select **New Project** from the **File** menu

Step 2: Select one of the map templates.

Step 3: In Object Mode (**Ctrl + O**), place the cursor where you want your player to start and left click. The best place to takeoff from is a runway (marked as green dots)

Step 4: When the Edit Object window pops up, change only the following settings:

Group/player ID = **0**
Format = **Active**
Type = **Player**
Precise Height = **checked**

Step 5: Click on **A.I. >>** and alter only the following settings:

Object Type = **Air**
AI Type = **F22**
Group = **STORM**
Rank = **Leader**

Step 6: Hit **OK** and **OK** again. You have just made the player. Feel free to move the player around by right clicking the mouse on it.

Step 7: Now you need to place some Waypoints for your player's navigational computer/autopilot. Before you can begin, you must create a Waygroup by selecting **New Group** under the **WayPoint** Menu.

Step 8: Select **Player Waypgroup**. You are now ready to start laying down waypoints for your player.

Step 9: In Waypoint Mode (**Ctrl + W**), place your first Waypoint by left clicking the mouse somewhere on the map.

Step 10: Place a couple more down. They will automatically connect to the previous one. On the second to last one, change the Command Type to **Initial Approach**. Change the last one to **Final Approach**. These should lead back to the runway.

You are now ready to begin placing enemies, selecting mission loadouts and deciding on mission goals. Don't forget to save your work often. Mission Designers will typically keep several back-ups of their files just in case they make mistakes or corrupt their current file.

3: Forming Waygroups & Taxigroups

It is usually a good idea to set up some waygroups and taxigroups before you begin placing objects. Aircraft and moving ground objects follow Waypoints that you define. Aircraft preparing to takeoff from the ground follow Taxipoints. Objects will only follow the path that they are assigned to. Waypoints are also known as Steerpoints.

Waygroups

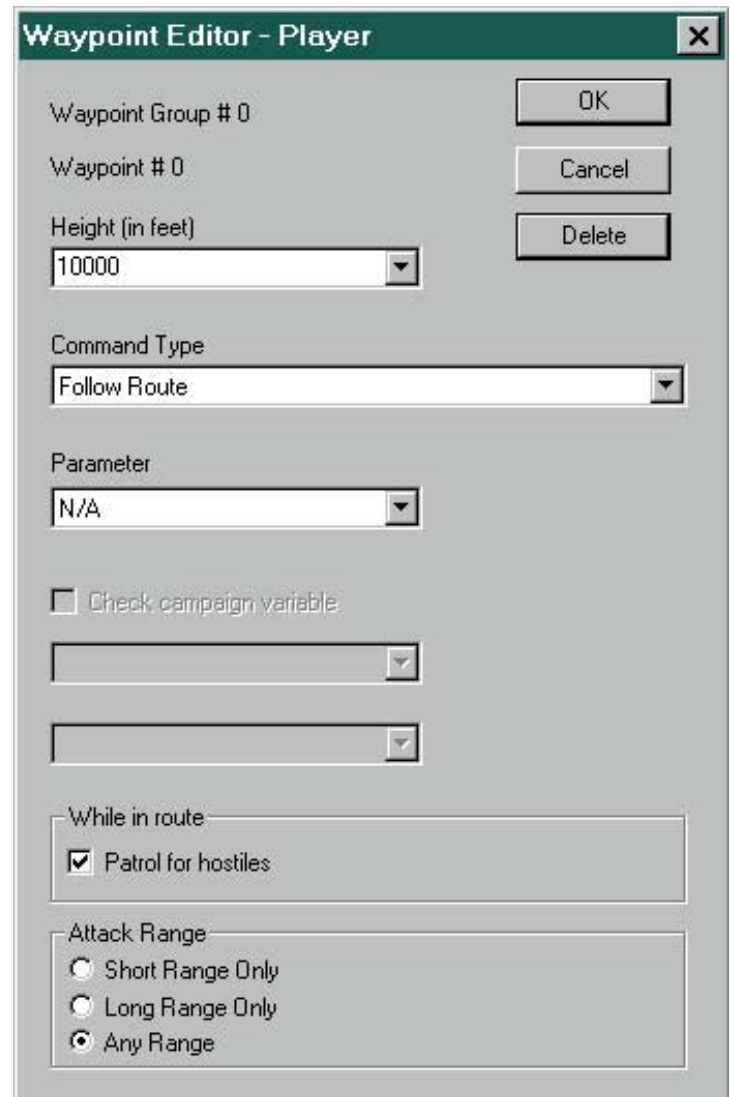
To create a new Waygroup, select **New Group** under the **Waypoint** menu. Select **Player Waygroup** only to create waypoints for the player. In all other cases, select **AI Waygroup**. Before you select another New Waygroup, place a waypoint on the map. This will establish the current waygroup. You can always move it or add to it at a later time.

Waypoint Group # - number is used to assign waygroups to aircraft and moving ground objects in their AI Options

Waypoint # - the sequential order of the waypoints in this group.

Height (in feet) - sets the height that the player's autopilot or the AI-controlled plane will fly at when it gets to this particular waypoint. Select from the list or type on your own number. Ground objects will ignore this value. Note this is ASL, not AGL.

Command Types - actions that the object will do once it reaches this waypoint. Different commands exist for Player Waypoints and AI Waypoints.



The image shows a screenshot of the 'Waypoint Editor - Player' dialog box. It has a title bar with a close button (X). The dialog contains several fields and controls: 'Waypoint Group # 0' with an 'OK' button; 'Waypoint # 0' with a 'Cancel' button; 'Height (in feet)' with a dropdown menu showing '10000' and a 'Delete' button; 'Command Type' with a dropdown menu showing 'Follow Route'; 'Parameter' with a dropdown menu showing 'N/A'; a checkbox labeled 'Check campaign variable'; two empty dropdown menus; a section titled 'While in route' with a checked checkbox 'Patrol for hostiles'; and a section titled 'Attack Range' with three radio buttons: 'Short Range Only', 'Long Range Only', and 'Any Range' (which is selected).

The following commands are for the Player:

Follow Route - "Follow route" will be displayed on your HUD next to the waypoint.

Escort Route - displayed on your HUD.

Initial Approach - displayed on your HUD. (Second to last waypoint must be Initial Approach. Place 4-6 grid tiles from the landing strip with height of around 2000 feet.)

Final Approach - displayed on your HUD. (Last waypoint must be Final Approach. Place 1-2 grid tiles from the landing strip with a height of around 1000 feet. Be certain it comes from the proper approach direction.)

Engage Hostiles - displayed on your HUD.

Protect Friendlies - displayed on your HUD.

Attack Specific target - does not apply to the player.

Attack Flight Group - displayed on your HUD. If you select this, it will ask you for a parameter. Choose the name of the flight group that you want to come after "attack flight group" that is displayed on your HUD. For example, if you select Bravo as your parameter, then the following will appear on your HUD: "Attack Flight Group: Bravo"

Attack Ground Group - the same logic applies here. The only difference here is that you're using ground group names.

The following command types are for AI-controlled planes or moving ground objects:

Goto Next Waypoint - tells the object to continue to the next waypoint.

Goto Specific Waypoint - tells the object to redirect to the waypoint you assign in parameters. Telling the object to redirect to Waypoint #0 is a great way to have the object move in a looping patrol route or CAP. The last AI Waypoint must be Goto Specific Waypoint.

Obsolete – do not use this value, it is not intended for single player quick missions.

Attack Specific Target - tells the object to attack whatever target you assign in the parameter. Use the Target Ref # of the specific object.

Attack Flight Group - tells the object to attack whatever flight group name you assign in the parameter.

Change Formation - changes the flight formation to the one you designate in parameter.

Helicopter Land - tells any helicopter that reaches this waypoint to stop and land vertically.

Escort Flight Group – tells the flight group to escort another flight group. Once a flight group reaches this waypoint, it will escort the flight group designated in the parameter.

Reload - This waypoint will automatically fully restore the aircraft's initial loadout.

Parameters – certain commands will require extra information.

Patrol for hostiles – set this flag if you want the aircraft to actively target enemy aircraft while en route.

Short Range Only – at this waypoint, the object will use only short-range weapons.

Long Range Only - at this waypoint, the object will use only long-range weapons.

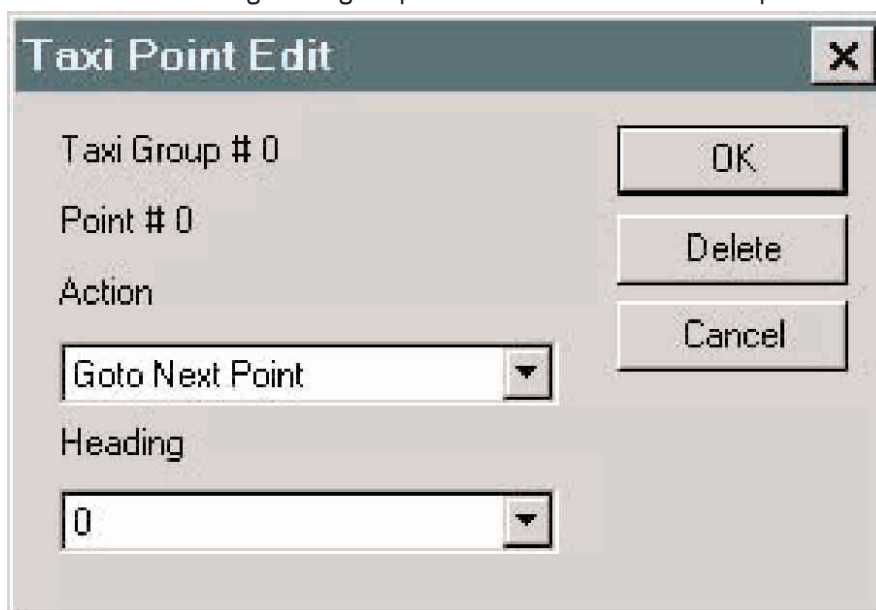
Any Range - at this waypoint, the object will use all weapons as required.

Taxigroups

If you wish to create a new Taxigroup, select **New Group** under the **Taxigroup** menu. Before you select another New Taxigroup, place a taxipoint on the map. This will establish the current taxigroup. You can always move it or add to it at a later time. Taxigroups are used for all Air Objects except helicopters and Harriers.

Unlike Waypoints, the editor screen does not automatically open when you lay down a point. Instead each Taxipoint is defaulted to "Goto Next Point". You will have to manually open any taxipoints that you wish to change the properties of.

Taxi Group # - number is used to assign taxigroups to aircraft in their AI Options



Point # - the sequential order of the waypoints in this group.

Action - actions that the object will do once it reaches this taxipoint.

Goto Next Point – aircraft will head to the next sequential taxipoint.

Takeoff – tells aircraft to begin takeoff procedure.

Next Start – same as Goto Next Point, but also informs the next aircraft in formation to begin moving.

Stop - Vehicles entering this taxipoint will come to a final stop. They will not proceed to any further taxipoints.

Heading – determines the compass heading of the aircraft.

4: Placing Objects

After you have established some waygroups, you can begin placing objects. Objects represent every thing your player's aircraft can encounter, from enemy planes, ground target buildings to scenery such as trees and water towers. Make certain that you set all of the appropriate variables for every object. Note that for ease of placing multiple objects in the same group, the next object you place will have all of the same attributes except the Group/player ID.

The 'Add Object' dialog box contains the following fields and options:

- Target Ref # 14**: A text field showing the assigned reference number.
- Perm ID: N/A**: A text field showing the permanent ID.
- Group/player ID**: A text field with the value '1'.
- Heading (0-359)**: A text field with the value '0'.
- Object**: A dropdown menu showing 'Kuznetsov Aircraft Carrier w/ Su-25s'.
- Format**: A dropdown menu showing 'Static'.
- Type**: A dropdown menu showing 'Scenery'.
- Render**: A dropdown menu showing 'Normal'.
- Height (feet)**: A text field with the value '0.00'.
- Icon**: A dropdown menu showing an empty icon.
- Location**: Two text fields for X and Y coordinates, with values '12:34816' and '122:4095' respectively.
- Base Marker**: ☐
- Precise Height**: ☐
- Displayed on Map**: ☐
- Display On Map Only**: ☐
- Display if:** ☐ out of ☐ times
- Add if** ☐ or more players
- Player Variant**: ☐
- Ground Object Targeting**:
 - ☐ Pre-programmed
 - ☐ Externally Laser Designated
 - ☐ Ground Moving Target
 - ☐ Target is Out to Sea

Buttons on the right: OK, Cancel, Delete, A.I. >>

Target Ref # - the tool will assign a unique reference number to every object.

Perm ID - this ID is not relevant for single player quick missions.

Group/player ID - You must consecutively number objects that are part of a group.

The Leader must always be zero, all additional Support should be in sequential order thereafter.

Heading - 360 degrees compass heading of the object. (Zero is true north)

Object - select the art appropriate for the object you are representing. This option will be grayed out when you are creating the player.

Format – Aircraft, vehicles, SAM sites, should have Active Radar. Objects with no radar awareness such as buildings should be set to Static.

Base Marker – check this box to have the object appear as an “X” on the Tactical Map (The Tactical Map appears when the player presses **F11**).

Type – this will determine how other objects will react to this one based on their own AI configurations.

Precise Height – always check this box for ground objects. Do not check it for objects that start in the air.

Height – only objects that start in the air should have this value set above zero. Because topography varies across the map, be careful how low you set air objects, or they may be underground.

Displayed on Map – check this box if you want the object to appear on the Mission Briefing Map.

Icon – If Display on Map is checked, select the Icon that you would like the object to appear as on the Mission Briefing Map.

Player Variant - Select a number between -1 and 7 to choose the skin design on the player's F-22.

-1 Game Randomly Selects Player Skins.

0 Brown/Tan with #’s on tail.

1 Brown/Tan with CARDS on tail.

2 Brown/Tan with Bowling Ball/Bomb-Pins on tail.

3 Brown/Tan with SKULL on tail.

4 Gray camo with #’s on tail.

5 Gray camo with CARDS on tail.

6 Gray camo with 8 Ball on tail.

7 Gray camo with SKULL on tail.

Ground Object Targeting:

Pre-programmed – allows certain air to ground ordnance such as JDAMs, KAB 500, Mavericks, Keglers and Kedge (T) to lock on to this object as a pre-programmed ground target.

Externally Laser Designated – check if you want the JDAMS Bombs to target this as a ground object.

Ground Moving Target – for air to surface thermal imaging guidance systems such as the Maverick.

Target is Out to Sea – designating ships as out to sea will increase the range for the Harpoon anti-ship missile.

Click on **A.I. >>** to go to the next page of Object AI Options

A.I. Options

Properties

Object Type: Air

AI Type: F22

Skill: Novice

Group: ALPHA

Rank: Leader

Taxigroup Number: Not Available

Waygroup Number: Not Available

Formation: Formation #0

Assignment

Players: Attack

Fighters: Attack

Bombers: Attack

Cargo Planes: Attack

Ground Threats: Attack

Ground Targets: Attack

Info

Assignment only applies to planes. If campaign var is used, the object will appear only if the var is set/not set.

Conditions

☐ Wait for trigger

☐ Start in air

☐ Fuel tank

☐ Check campaign var

Other info

☐ AWACS Radar Plane

☐ Object ignored by AI

☐ Object parked

Short Range Missiles: #0

Long Range Missiles: #0

Bombs: #0

Nuke Bombs: #0

OK Cancel Isolated Change

Properties:

Object Type – tells the game what type of object this is.

Air - tells the game to treat this object as an aircraft and tells it to follow assigned taxi points if it starts on the ground. Use this for all aircraft including helicopters.

Ground Target - Ground targets will not fire. Use this for all bombing targets.

Ground Threat - Ground threats will fire. Use this for SAMs, AAA, etc.

AI Type – depending on object type, this will determine certain AI characteristics such as how the object will fly or how much damage a ground target can withstand.

Skill – represents difference between the levels of AI in the frequency in which air objects use flare, chaff, and evasive maneuvering. It may also effect their detection and engagement range. This value is ignored for ground threats and targets.

Group – use this group designation for assigning mission goals, formations and way groups. Remember members of a group must have a sequential ID number with the Leader as zero. Also note that the player should always be set to Storm.

Rank – each group has one Leader (which must have its player ID set to zero). All other members of a group should be set to Support.

Taxigroup Number – assign aircraft that start on the ground to a Taxigroup.

Waygroup Number – assign aircraft in the air and moving ground objects to a way group. You should reserve Waygroup #0 for the player only.

Formation – aircraft that are flying as part of a group should also have a Formation.

See **Appendix A** for what formation each number represents.

Assignment:

Assignment - everything under the “Assignment” section of the A.I. Options Window tells the object how to respond to different enemy and friendly aircraft and ground objects.

Attack - The plane will attack any enemies of that type it encounters.

Ignore - the plane will ignore any enemies of that type it encounters.

Evade - the plane will actively evade any enemies of that type it encounters.

Protect - the plane will attack other planes that are targeting friendly of that type.

Conditions:

Start in Air - must be selected if your object is starting mid-air.

Fuel Tank - this object will refuel the player during auto-refuel. (Typically for KC-135 refueler)

Other Info:

AWACS Radar Plane - tells the game to treat this object as an AWACS. Having an AWACS in any mission will allow the player to have 360 degree radar coverage even if the plane's radar is turned off.

Object ignored by AI - this object will be untouched by enemy and friendly AI.

Short Ranged Missiles – Air objects will have short-range missiles such as Sidewinders.

Long Ranged Missiles - Air objects will have long-range missiles such as AMRAAMS.

Bombs - Air objects will have bombs such as JDAMS.

Nuke Bombs - Air objects will have B61 Thermonuclear Bombs.

Isolate Change - restricts any changes you have made to that object from affecting the other objects within the same group. You may want to use this button when you place down the first object of a new air or ground group. If you don't, any changes you make to this new group might effect your previous groups

5: Editing Mission Details

Edit Mission: Select the **Time of Day** when you want the mission to take place. Use the **Mission Loadout** to select the default loadout available to the player. To add a weapon, scroll through the list in **Weapon Type** and type the number of them you want on the aircraft, then press **Add to Mission Loadout**. To remove a weapon, click on the weapon name under **Mission Loadout** and press **Delete Weapon**.

Edit Mission Text: Fill in the text that the player will see while on the Mission Briefing screen.

Edit Mission Goals: In order to save the scenario, you must have a primary mission goal. Secondary Goals, Bonus Goals and Failure Conditions are all optional. With this tool, you can only select one goal of each type.

Weather - Temperature will have an effect on the performance of the plane as well as add to the possibility of weather effects. F-22 Lightning 3 uses a roving weather pattern overlay that allows for various pockets of weather during the game. In pockets that get below 25 degree Fahrenheit, it will begin to snow. From 25 to 33 degrees, the F-22 will encounter hail. It will rain everywhere else. Note you must set the Time of Day in the Edit Mission screen to Storm if you want any weather conditions to appear in your mission.

Minimum Temperature - This is the lowest temperature that can be reached in the mission.

Temperature - This is the starting temperature for the map (specific to each time of day).

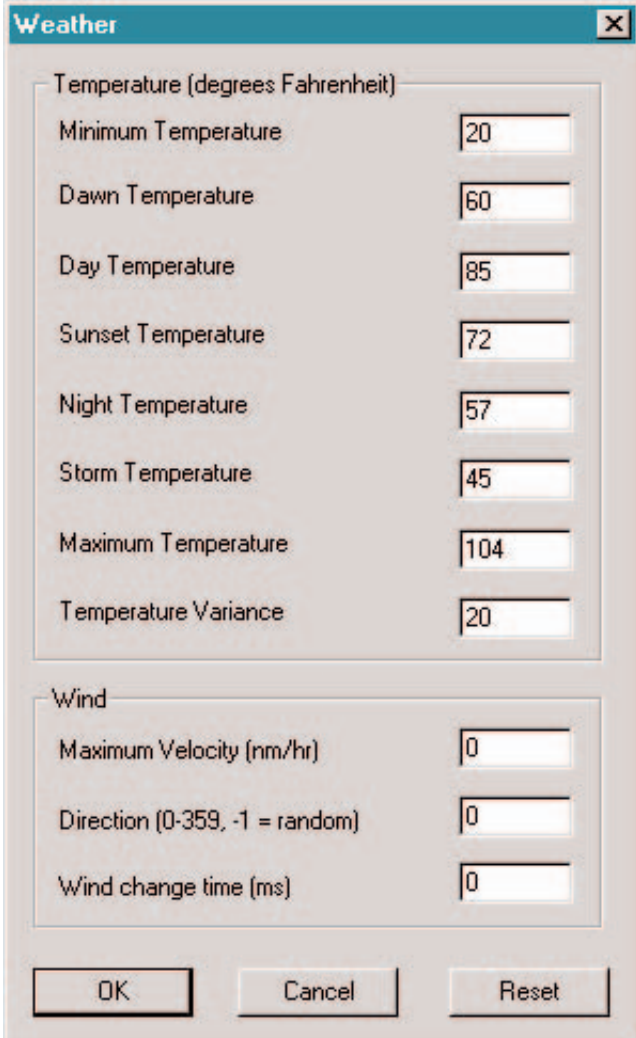
Maximum Temperature - This is the highest temperature that can be reached in the mission.

Temperature Variance - The temperature will drop this amount in the worst weather conditions on the map. The greater the temperature variance, the more severe weather changes your mission will have.

Maximum Wind Velocity - This number determines the maximum speed the wind can get to during a mission. Do not set this value too high, aircraft does not handle well in wind speeds that approach hurricane level (64 knots).

Direction - This value sets the direction the wind is blowing to. Setting it at 180 will mean the wind is blowing from North to South.

Wind change time - The computer will randomly vary the wind up to 50% of its current rate every time this number of milliseconds pass. It is recommended that you set this number high, such as 30000 (every 30 seconds the wind speed will change).



The screenshot shows a 'Weather' configuration window with a title bar and a close button. It contains two main sections: 'Temperature (degrees Fahrenheit)' and 'Wind'. Each section has several input fields with numerical values. At the bottom, there are three buttons: 'OK', 'Cancel', and 'Reset'.

Temperature (degrees Fahrenheit)	
Minimum Temperature	20
Dawn Temperature	60
Day Temperature	85
Sunset Temperature	72
Night Temperature	57
Storm Temperature	45
Maximum Temperature	104
Temperature Variance	20

Wind	
Maximum Velocity (nm/hr)	0
Direction (0-359, -1 = random)	0
Wind change time (ms)	0

Buttons: OK, Cancel, Reset

6: Saving & Exporting Missions

Select **Save All** under the **File** menu to save your work in progress. It will prompt you to save out an Object file (**OBJ**), a Resource File (**RC**) and a Project file (**PRJ**). For easy retrieval, use the same name for all three.

In order to play the mission, you will need to export it in to an **MIB** file using **Export** under the **File** menu. The MIB file contains all of the necessary data in one file, which you can play or share with friends. Remember what folder you placed it into.

The program will let you know if you have any errors that would prevent your mission from being playable. To view these errors, please refer to [**Section 8: Error Messages**](#).

At the very least, this is a checklist of things that must be present in your mission:

- ☐ 1 Player, correctly configured
- ☐ 3 Waypoints for the player with the last 2 being Initial and Final Waypoint
- ☐ Primary Mission Goal selected

To play your mission, start the game itself. Select **User Created** on the **Quick Mission** screen. When prompted, select your MIB file.

7: Hints and Tips

1. When editing any ground object such as SAM sites, or other ground forces, make sure that “precise height” is check marked in the “edit object” window.
2. When laying down the player’s waypoints, make sure that the final two waypoints are initial approach and final approach, respectively.
3. The flight leader of **any** flight group must have a group/player ID of 0. This includes the player as well. You must have one and only one flight leader for each one of your flight groups. The flight leader in the game acts as the target selector.
4. When laying down SAM units, make sure to include a SAM radar and the SAM sites under the same group name. The SAMs won’t fire unless they have their own radar. Moreover, the SAM radar should always have a radar ID of 0 and the sites should have IDs of 1,2,3, etc.
5. Enemy planes stationed on the ground will not take off unless you give them their own set of taxipoints. Make sure to designate these points in the planes’ AI.
6. Try not to mix and match planes of different group names into the same flight formation. Unpredictable things might happen.
7. If you want the enemy flight group to return to its first waypoint after reaching its final waypoint (thereby flying in a loop), under “command type” select “Go to specific Waypoint #”; The “parameter” should automatically be set as waypoint 0.
8. It is important to note that any object you put in the game can be assigned any flight performance. For example, you could make an AN225 cargo plane fly and shoot just like an F-16. The AI type tells the game what type of flight performance to give to any particular object. The F16 performance type, for example, would be faster and more maneuverable than the bomber or cargo plane type. The difference between the helicopter and harrier type is in performance and takeoff. Selecting the harrier type will result in an object capable of taking off like a helicopter but then assuming the speed and maneuverability of a jet. The cargo heli type is similar to the helicopter type, but slower and will not fire.
9. Runways cannot be changed.
10. If you load up your mission in the editor and you don’t see the objects that you just spent the past 2 hours laying down, don’t freak out! Go to the **Object** menu and check the **Display** on. This will cure your insanity.

8: Error Messages

When you attempt to save a project you may be warned of errors within your mission. All problematic objects will change to a dark blue color for ease of locating. The errors will also be written to the **Error.log** file, which can be opened by any text/word browser.

warning = warning written to error.log, MIB file still be generated

error = error written to error.log, MIB file is NOT generated, problem must be fixed

Severity

Problem

mission data structure

error file not referenced in project

mission loadout, triggers and messages

error no Primary Mission Objective, go to **Edit Mission Goals**
warning no messages for Mission Briefing, go to **Edit Mission Text**
warning no weapons selected, go to **Edit Mission**
warning invalid weapon

models

error number of models used exceeds max number of models
error no models

objects

error leader does not have an ID of 0
error AI way group assigned to player
error no players
error more than max number of players
error more than one leader per group
error flight group doesn't have a leader
error player assigned to improper flight group
error flight group must have consecutive ID's
error active flight group cannot have more than nine planes
error player cannot have more than one wingman

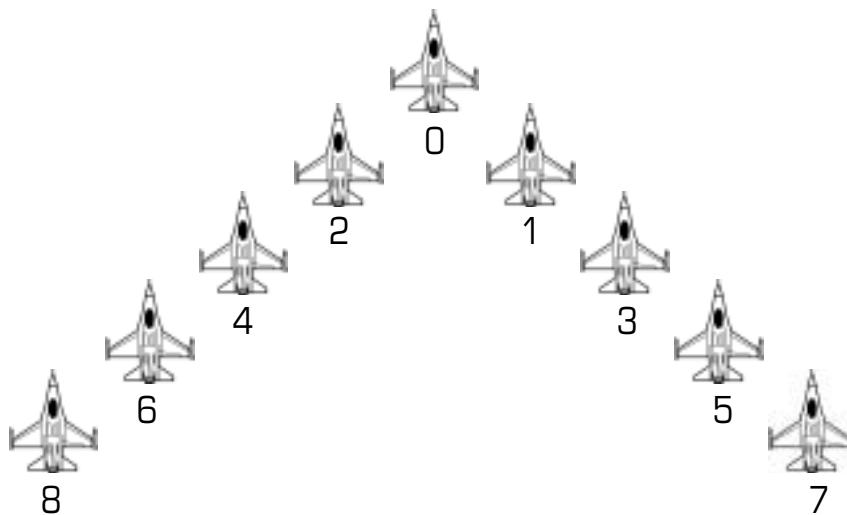
way points

error no waygroups exist
error player waygroup does not have at least three points
error last player way point not "Final Approach"
error next to last player way point not "Initial Approach"
error last A.I. waypoint must be "Goto Specific Waypoint"

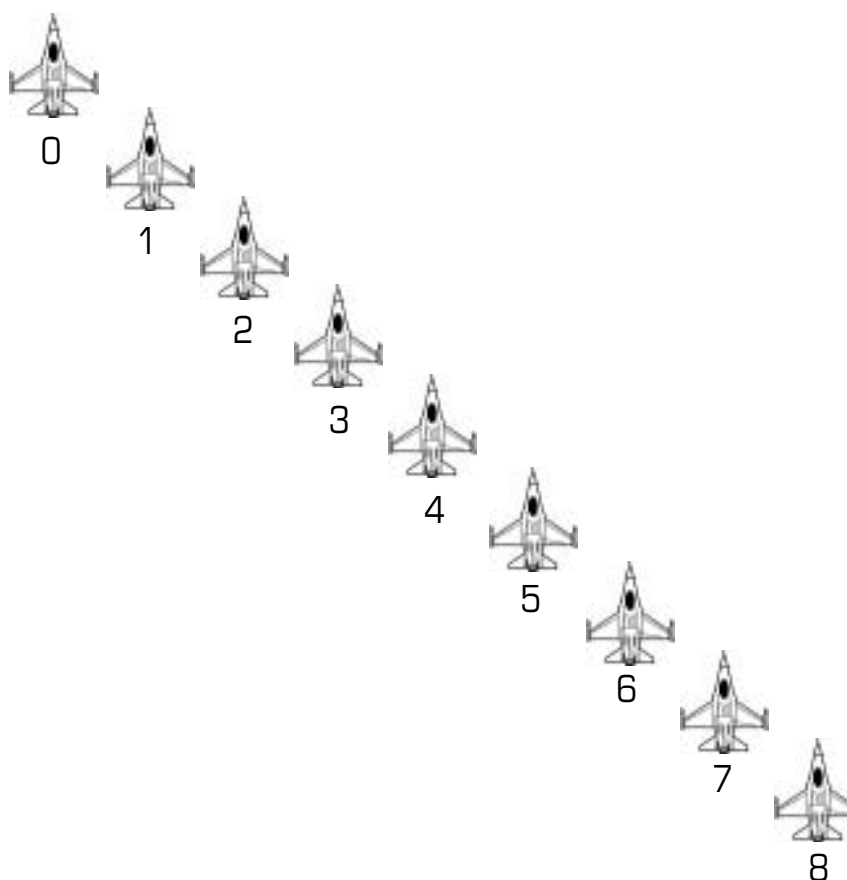
Appendix A: Formations

When you assign a plane group to a formation, the Group/player ID number will determine its location. Zero represents the group leader. The examples below are based on a Heading of zero (North).

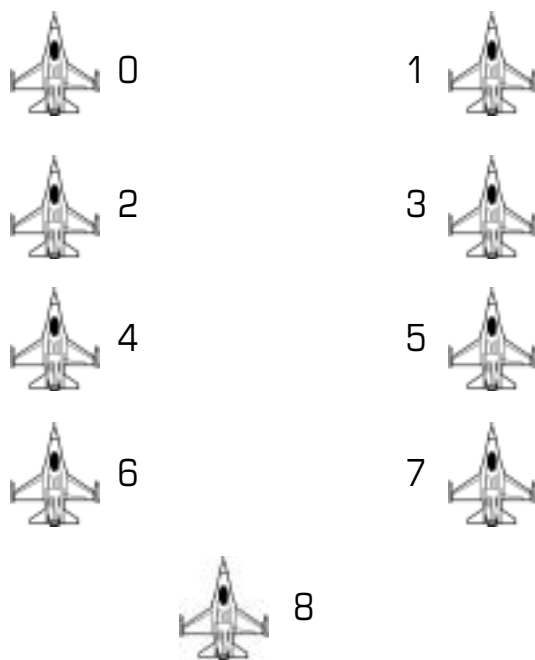
FORMATION 0



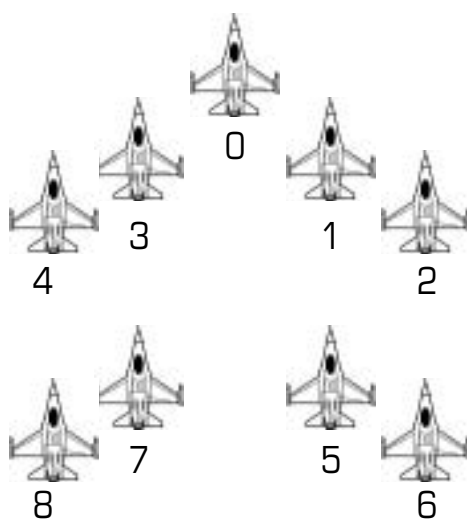
FORMATION 1



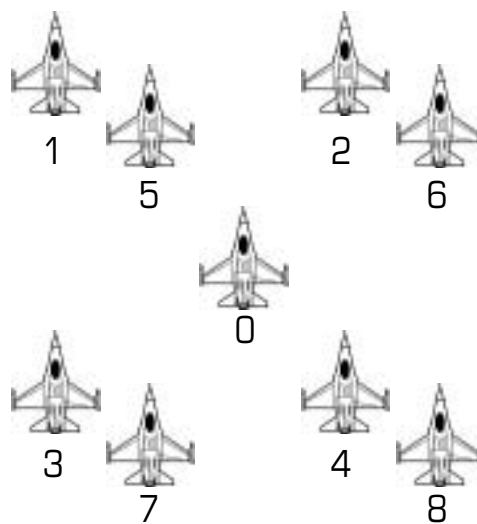
FORMATION 2



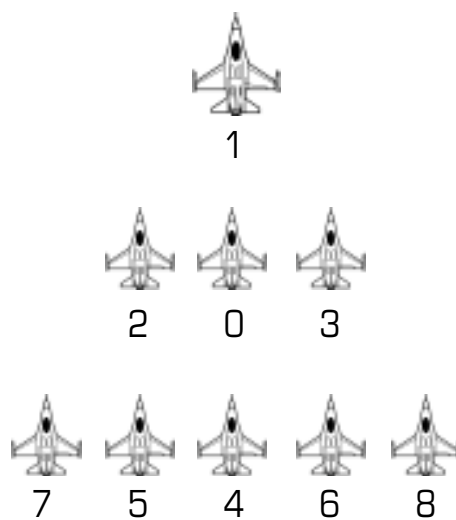
FORMATION 3



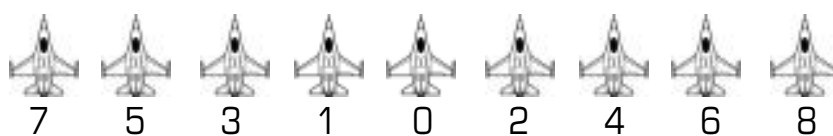
FORMATION 4



FORMATION 5



FORMATION 6



FORMATION 7

